VIT Vidyalankar Institute of Technology
Accredited A+ by NAAC

Vidyalankar Institute of Technology

An Autonomous Institute affiliated to University of Mumbai

Bachelor of Technology

in

Electronics & Telecommunication Engineering

with Multidisciplinary Minor

Programme Structure (R-2023)

(As per NEP 2020, with effect from the Academic Year 2023-24)

Preamble

The National Education Policy (NEP) framework aims to break the mould from teacher centric to student centric educational practices. It empowers the students with flexibility in terms of choosing courses across different faculties and mode of learning.

This multidisciplinary approach will encourage learners to follow their passion and inherent interests. The learner is free to learn at a pace that he is comfortable with and this enables life long learning. It also enhances the scope for holistic personality development.

This premise is truly reflected in preamble of the NEP document, "The future of nation is decided in the classrooms of the schools and colleges today".

Details of implementation:

NEP curriculum framework enables us to accelerate change, redesign systems with equity in mind, respond to feedback, encourage collaboration, catch and pollinate ideas and create a culture of research and development. It will allow us to offer the required academic flexibility which will focus on improving competency level of students with diverse strengths.

The curriculum planned by VIT has vertical Program Courses consisting of core courses (PCC) of branch of engineering positioned and sequenced to achieve sequential and integral learning of the entire breadth of the specific branch. This vertical also includes Programme elective courses (PEC) which offer flexibility and diversity to learners to choose specialization from a basket of recent developments in their field of technology. The selection of unique professional elective courses based on industrial requirements and organizing them into tracks is a special feature of this curricula ensuring employability.

The vertical Multidisciplinary Courses consists of Open Elective (OE) courses and multidisciplinary minor (MD M) courses. Special vocational and skill development courses are included as a part of Skill courses vertical that make student capable to work in industrial environment.

The student is expected to demonstrate their ability through course in Experiential Learning Courses vertical like internships/On Job Training, Community Engagement Project, Real Industry Project/ research problem. Our curriculum also introduces Social Service Internship and Internship with institutes abroad along with courses like Design Thinking. This will lead to creation of products and/ or patents through this program.

For holistic development of students, apart from technical courses, Ability Enhancement Courses, Entrepreneurship/Economics/Management Courses, Indian Knowledge System and Value Education courses from vertical Humanities and Social Science and Management develop the required soft-skills and attitude amongst learners.

In Liberal Learning vertical. courses like Various Dance Forms, Global citizenship Education, Facets of Astronomy etc. aims to create balance in brain hemispheres and hence improve learners' clarity in thoughts and responses.

In addition to core courses, professional and open electives; our framework offers honor degree in each programme of engineering. It includes specialized courses along with field/ domain study that make student capable of working on industry relevant problems.

Chairman, Board of Studies
Department of Electronics and Telecommunication Engineering
Vidyalankar Institute of Technology

Chairman, Academic Council
Vidyalankar Institute of Technology

VERTICAL BASED CREDIT ALLOTMENT

Sr. No.	Verticals	Buckets	Credits
I	BSC/ESC	Basic Science	15
		Engineering Science	12
II	Program Courses	Programme Core Courses (PCC)	49
		Programme Elective Courses (PEC)	18
III	Multidisciplinary Courses	Multidisciplinary Minor (MDM)	14
IV		Open Electives (OE)	8
V	Skill Courses	Vocational and Skill Enhancement Courses (VSEC)	7
VI	Humanities Social Science and Management (HSSM)	Ability Enhancement Courses (AEC-01, AEC-02)	4
		Entrepreneurship/Economics/Management Courses	5
		Indian Knowledge System (IKS)	2
		Value education Courses (VEC)	3
VII	Experiential Learning Courses	Research Methodology	3
		Community Engagement Project (CEP)/Field Project (FP)	2
		Project	8
		Internship/OJT	12
	Liberal Learning Courses	Co-curricular Courses (CC)	4
Total			**166**

Learner is expected to complete requirement of 166 credits (with minimum credits under each category as mentioned above) for B.Tech. degree in Electronics and Telecommunication Engineering with Multidisciplinary Minor.

Additionally, learners can choose to avail i) B.Tech. in Electronics and Telecommunication Engineering – Honors and Multidisciplinary Minor or ii) B.Tech. in Electronics and Telecommunication Engineering - Honours with Research and Multidisciplinary Minor or iii) B.Tech. in Electronics and Telecommunication Engineering with Double Minors (Multidisciplinary and Specialization Minor) Degree by completing requirements of 18 credits, which will be over and above the 166 credits required for B.Tech. with Multidisciplinary Minor degree.

Definition of Credit

Duration	Credit
1 Hr. Lecture (L) per week	1
1 Hr. Tutorial (T) per week	1
1 Hr. Practical (P) per week	0.5

Courses under Various Baskets

I. Basic Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	BSC11T*	Engineering Chemistry	2	-	-	2	1
2	BSC116P*	Engineering Chemistry Lab	-	2	-	1	1
3	BSC02*	Engineering Mathematics- I	3	-	-	3	1
4	BS10T*	Engineering Physics	2	-	-	2	2
5	BS10P*	Engineering Physics Lab	-	2	-	1	2
6	BSC04*	Engineering Mathematics-II	3	-	-	3	2
7	BSC06	Engineering Mathematics-III	3	-	-	3	3

*** Courses exempted for Direct Second Year (DSY) students who will secure admission through lateral entry from the A.Y. 2024-25 onwards.**

II. Engineering Science Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	ESC02T*	Engineering Mechanics	2	-	-	2	1
2	ESC02P*	Engineering Mechanics Lab	-	2	-	1	1
3	ESC06T*	Basic Electrical & Electronics Engineering	2	-	-	2	1
4	ESC06P*	Basic Electrical & Electronics Engineering Lab	-	2	-	1	1
5	ESC07T*	Logic Circuit	2	-	-	2	2
6	ESC07P*	Logic Circuit Lab	-	2	-	1	2
7	ESC01T*	Engineering Graphics	2	-	-	2	2
8	ESC01P*	Engineering Graphics Lab	-	2	-	1	2

*** Courses exempted for Direct Second Year (DSY) students who will secure admission through lateral entry from the A.Y. 2024-25 onwards.**

III. Program Core Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PCET01T	Electronic Devices and Circuits	2	-	-	2	3
2	PCET01P	Electronic Devices and Circuits Lab	-	2	-	1	3
3	PCET02T	Principles of Communication Engineering	2	-	-	2	3
4	PCET02P	Principles of Communication Engineering Lab	-	2	-	1	3
5	PCET03T	Signal and Systems	2	-	-	2	4
6	PCET03P	Signal and Systems Lab		2	-	1	4
7	PCET101T	Network Theory and Transmission lines	2	-	-	2	3
8	PCET101P	Network Theory and Transmission lines Lab	-	2	-	1	3
9	PCET102T	Microprocessor & Microcontroller	2	-	-	2	3
10	PCET102P	Microprocessor & Microcontroller Lab	-	2	-	1	3
11	PCET06T	Integrated Circuits	2	-	-	2	4
12	PCET06P	Integrated Circuits Lab	-	2	-	1	4
13	PCET07T	Data Structure & Analysis of Algorithm	2	-	-	2	4
14	PCET07P	Data Structure & Analysis of Algorithm Lab	-	2	-	1	4
15	PCET09T	Digital Communication	2	-	-	2	4
16	PCET09P	Digital Communication Lab	-	2	-	1	4
17	PCET10T	Digital Signal Processing	2	-	-	2	5
18	PCET10P	Digital Signal Processing Lab	-	2	-	1	5
19	PCET103T	Electromagnetics and Antenna	2	-	-	2	5
20	PCET103P	Electromagnetics and Antenna Lab	-	2	-	1	5

Sr.	Course	Course Title	Hours Per Week			Credits	Preferred
21	PCET104T	RF and Microwave Engineering	2	-	-	2	6
22	PCET104P	RF and Microwave Engineering Lab	-	2	-	1	6
23	PCET105T	Optical Communication	2	-	-	2	7
24	PCET105P	Optical Communication Lab	-	2	-	1	7
25	PCET14T	Mobile Communication	2	-	-	2	6
26	PCET14P	Mobile Communication Lab	-	2	-	1	6
27	PCET16T	Computer Network	2	-	-	2	5
28	PCET16P	Computer Network Lab	-	2	-	1	5
29	PCET18T	Basic VLSI Design	2	-	-	2	5
30	PCET18P	Basic VLSI Design Lab	-	2	-	1	5
31	PCET106T	Mathematical theory of Communication	2	-	-	2	4
32	PCET106P	Mathematical theory of Communication Lab	-	2	-	1	4
33	PCET08P	Instrumentation and Control Lab	-	2	-	1	4

IV. Programme Elective Courses

Name of the track: Communication Engineering

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PEET20T	Modelling and Analysis of Communication System	2	-	-	2	5
2	PEET20P	Modelling and Analysis of Communication System Lab	-	2	-	1	5
3	PEET21T	Telecommunication Network Management	2	-	-	2	6
4	PEET21P	Telecommunication Network Management Lab	-	2	-	1	6
5	PEET22T	Tracking System	2	-	-	2	6
6	PEET22P	Tracking System Lab	-	2	-	1	6
7	PEET23T	OFDM and MIMO Technology	2	-	-	2	7
8	PEET23P	OFDM and MIMO Technology Lab	-	2	-	1	7
9	PEET24T	Satellite Communication	2	-	-	2	7
10	PEET24P	Satellite Communication Lab	-	2	-	1	7
11	PEET25T	Wireless sensor networks	2	-	-	2	7
12	PEET25P	Wireless sensor networks Lab	-	2	-	1	7

Name of the track: Data Analytics and Machine Learning

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PEET26T	Database Management System	2	-	-	2	5
2	PEET26P	Database Management System Lab	-	2	-	1	5
3	PEET27T	Introduction to Data Analytics	2	-	-	2	6
4	PEET27P	Introduction to Data Analytics Lab	-	2	-	1	6
5	PEET28T	Machine Learning	2	-	-	2	6
6	PEET28P	Machine Learning Lab	-	2	-	1	6
7	PEET29T	Data Mining	2	-	-	2	7

8	PEET29P	Data Mining Lab	-	2	-	1	7
9	PEET30T	Big data Analytics	2	-	-	2	7
10	PEET30P	Big data Analytics Lab	-	2	-	1	7
11	PEET31T	Deep Learning	2	-	-	2	7
12	PEET31P	Deep Learning Lab	-	2	-	1	7

Name of the track: Internet of Thing

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PEET32T	Modern Sensors for Internet of Thing	2	-	-	2	5
2	PEET32P	Modern Sensors for Internet of Thing Lab	-	2	-	1	5
3	PEET33T	Principles of Internet of Things (IoT)	2	-	-	2	6
4	PEET33P	Principles of Internet of Things (IoT)Lab	-	2	-	1	6
5	PEET34T	Embedded System Design with Tiny Operating System (OS)	2	-	-	2	6
6	PEET34P	Embedded System Design with Tiny Operating System Lab	-	2	-	1	6
7	PEET35T	Internet of Things (IoT) and Edge Computing	2	-	-	2	7
8	PEET35P	Internet of Things (IoT) and Edge Computing Lab	-	2	-	1	7
9	PEET36T	Internet of Things (IoT) Security and Trust	2	-	-	2	7
10	PEET36P	Internet of Things (IoT) Security and Trust Lab	-	2	-	1	7
11	PEET37T	Industrial Internet of Things (IIoT)	2	-	-	2	7
12	PEET37P	Industrial Internet of Things (IIoT) Lab	-	2	-	1	7

Name of the track: Very Large-Scale Integration (VLSI)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PEET38T	Digital System Design	2	-	-	2	5
2	PEET38P	Digital System Design Lab	-	2	-	1	5
3	PEET39T	Advanced VLSI Design and Technology	2	-	-	2	6

4	PEET39P	Advanced VLSI Design and Technology Lab	-	2	-	1	6
5	PEET40T	Analog IC Design	2	-	-	2	6
6	PEET40P	Analog IC Design Lab	-	2	-	1	6
7	PEET41T	ASIC and Verification	2	-	-	2	7
8	PEET41P	ASIC and Verification Lab	-	2	-	1	7
9	PEET42T	System on Chip	2	-	-	2	7
10	PEET42P	System on Chip Lab	-	2	-	1	7
11	PEET43T	Mixed signal VLSI	2	-	-	2	7
12	PEET43P	Mixed signal VLSI Lab	-	2	-	1	7

V. Multidisciplinary Minor (MDM)

Sr. No.	Title of MDM	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
				Theory	Practical	Tutorial		
1	-	MDM01	Seminar	2	-	-	2	8
2	Bioinformatics	MDMBI01	Introduction to Bioinformatics	3	-	1	4	5
		MDMBI02	Algorithms and Data Structures in Bioinformatics	3	-	1	4	6
		MDMBI03	Machine Learning Applications in Bioinformatics	3	-	1	4	7
3	Innovation, Entrepreneurship and Venture Development	MDMIE01	Foundations of Innovation and Entrepreneurship	3	-	1	4	5
		MDMIE02	Startup Planning and Development	3	-	1	4	6
		4MDMIE03	Innovation Management and Scaling Startups	3	-	1	4	7
4	Business Development, Marketing and Finance	MDMBD01	Introduction to Business Development and Marketing Principles	3	-	1	4	5
		MDMBD02	Financial Basics for Engineers and Technopreneurs	3	-	1	4	6

Sr. No.	Title of MDM	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
				Theory	Practical	Tutorial		
		MDMBD03	Strategic Marketing and Business Planning	3	-	1	4	7
5	Robotics	MDMRB01	Fundamentals of Robotics and Control	3	2	-	4	5
		MDMRB02	Machine Vision and Robotic Perception	3	2	-	4	6
		MDMRB03	Intelligent Mobile Robotics	3	2	-	4	7
6	Computer Science	MDMCS01	Computational Logic and Data Structures	3	2	-	4	5
		MDMCS02	Operating System & Computer Networks	3	2	-	4	6
		MDMCS03	Database Systems & Introduction to Data Mining	3	2	-	4	7

VI. Open Elective Courses

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1.	OEC02	Cyber Law	2	-	-	2	8
2.	OEC03	Project Management	2	-	-	2	8
3.	OEC04	Product Lifecycle Management	2	-	-	2	8
4.	OEC05	Sustainability Management	2	-	-	2	8
5.	OEC06	Renewable Energy Management	2	-	-	2	8
6.	OEC01[$]	Collaborative Inter-Institute Studies	4	-	-	4	Summer break between Sem 4 and Sem 5

[$]**Collaborative Inter-Institute Studies:** Collaborative studies with other reputed institutes equivalent to 4 credits is recommended to be done by learners during second year inter semester break (I,e summer break between semester 4 and semester 5)

VII. Vocational and Skill Enhancement Courses (VSEC)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	VSEC01T	Structured Programming	2	-	-	2	1
2	VSEC01P	Structured Programming Lab	1	-	-	1	1
3	VSEC02T	Object Oriented Programming	2	-	-	2	2
4	VSEC02P	Object Oriented Programming Lab	1	-	-	1	2
5	VSEC05	Skill Based Lab	1	-	-	1	3

VIII. Ability Enhancement Courses (AEC)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	AEC01T	Effective Communication	2	-	-	2	1
2	AEC01P	Effective Communication Lab	-	2	-	1	1
3	AEC04	Technical Communication	-	2	-	1	3

IX. Entrepreneurship/ Economics/ Management Courses (EEMC)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	EEMC03	Engineering Economics	2	-	-	2	6
2	EEMC01	Design Thinking	3	-	-	3	2

X. Indian Knowledge System Courses (IKS)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	IKS03	Exploring Indian Art	2	-	-	2	3
2	IKS01	Indian Traditional Knowledge System	2	-	-	2	3
3	IKS02	Indian Constitution	2	-	-	2	3

XI. Value Education Courses (VEC)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	VEC01T	Professional Skills	2	-	-	2	2
2	VEC01P	Professional Skills Lab	-	2	-	1	2
3	VEC03	Universal Human Values	2	-	-	2	2
4	VEC04	Responsibility towards sustainable environment	2	-	-	2	2
5	VEC05	Four Pillars of Democratic Nation	2	-	-	2	2

XII. Experiential Learning Courses (ELC)- Research Methodology (RM)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	RM01	Research Methodology	3	-	-	3	8

XIII. Experiential Learning Courses (ELC)- Comm. Eng. Project (CEP)/ Field Project (FP)

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	CEP01#	Social Service Internship/ Project	2	-	-	2	4

 # For CEP01- Social Service Internship/ Project: 2 hours / week slot will be provided during the semester (in regular timetable). Additional work of 60 hours needs to be completed during the semester (besides regular timetable) or after the semester (during inter semester break).

XIV. Experiential Learning Courses (ELC)- Project

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	PRJET45	Mini Project- 1 (Hardware)	-	4	-	2	4
2	PRJET110	Project-1 (Synopsis)	2	-	-	2	6
3	PRJET111	Project-2 (Final)	4	-	-	4	7

XV. Experiential Learning Courses (ELC)- Internship/ OJT

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	OJT01	Industry Internship#		150	-	5	Sem break between Sem 6 and

Sr. No.	Course Code	Course Title	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
							Sem 7
2	OJT02	Industry Internship	-	150+ (Total)	-	7	8

to be done during inter semester break between semester 6 and semester 7.

XVI. Liberal Learning Courses (LLC)- Co-curricular Courses (CC)

Sr. No.	Course Code	Course Name	Hours Per Week			Credits	Preferred Semester
			Theory	Practical	Tutorial		
1	CC01	Various Dance Forms	2	-	-	2	1/2
2	CC02	Corporate and Social Etiquettes	2	-	-	2	1/2
3	CC03	Global Citizenship Education	2	-	-	2	1/2
4	CC04	Wellness – Body, Mind & Spirit	2	-	-	2	1/2
5	CC05	IQ vs EQ	2	-	-	2	1/2
6	CC06	Nutrition and Physical Wellness	2	-	-	2	1/2
7	CC07	Facets of Astronomy	2	-	-	2	1/2
8	CC08	Railways - Wonders of Infrastructure	2	-	-	2	1/2
9	CC09	Financial Literacy for Engineers	2	-	-	2	1/2
10	CC10	Mastering Advanced Excel	2	-	-	2	1/2
11	CC11	Personal Grooming Essentials	2	-	-	2	1/2
12	CC12	Various Music Forms	2	-	-	2	1/2

Illustrative Semester wise

Credit Distribution Structure and Assessment Guidelines

(Based on NEP 2020 Guidelines)

for

Bachelor of Technology

in

Electronics and Telecommunication Engineering

with Multidisciplinary Minor

Semester wise credit distribution For B. Tech in Electronics and Telecommunication Engineering with Multidisciplinary Minor

Semester		**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Total Credits**
Sub-Category	**Verticals**									
Basic Science Course	BSC/ ESC	6	6	3						15
Engineering Science		6	6							12
Programme Core Course (PCC)	Program Courses (PC)			13	15	12	6	3		49
Programme Elective Course (PEC)						3	6	9		18
Multidisciplinary Minor (MDM)	Multidisciplinary Courses (MDC)					4	4	4	2	14
Open Elective (OE)						4*			4	8
Vocational and Skill Enhancement Courses (VSEC)	Skill Courses (SC)	3	3	1						7
Ability Enhancement Courses (AEC)	Humanities Social Science and Management (HSSM)	3		1						4
Entrepreneurship/ Economics/ Management Courses (EEMC)			3				2			5
Indian Knowledge System (IKS)				2						2
Value Education Courses (VEC)			3							3
Research Methodology (RM)	Experiential Learning Courses (ELC)								3	3
Comm. Eng. Project (CEP)/ Field Project (FP)					2					2
Project					2		2	4		8
Internship/ OJT								5[$]	7	12
Co-curricular Courses (CC)	Liberal Learning Courses (LLC)	2	2							4
Total Credits		20	23	20	19	23	20	25	16	166

***** Internship with other reputed institutes equivalent to 4 credits to be done by learner during summer break between semester 4 and semester 5.

$ Industry internship to be done during inter semester break between semester 6 and semester 7.

First Year B. Tech. Electronics and Telecommunication Engineering **Preferred Semester: I**

Course Structure and Assessment Guidelines

Course			Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Verticals	Code	Name			ISA	MSE	ESE	
BSC	BSC11T	Engineering Chemistry	Theory	2	15	20	40	075
	BSC11P	Engineering Chemistry Lab	Practical	1	25	-	25	050
	BSC02	Engineering Mathematics-I	Theory	3	20	30	50	100
ESC	ESC02T	Engineering Mechanics	Theory	2	15	20	40	075
	ESC02P	Engineering Mechanics Lab	Practical	1	25	-	25	050
	ESC06T	Basic Electrical & Electronics Engineering	Theory	2	15	20	40	075
	ESC06P	Basic Electrical & Electronics Engineering Lab	Practical	1	25	-	25	050
SC_VSEC	VSEC01T	Structured Programming	Theory	2	15	20	40	075
	VSEC01P	Structured Programming Lab	Practical	1	25	-	25	050
HSSM_AEC	AEC01T	Effective Communication	Theory	2	15	20	40	075
	AEC01P	Effective Communication Lab	Practical	1	25	-	25	050
LLC-CC	CCXX*	Any one CC course offered in the semester	As per Course	2	25	-	50	075
			Total Credits	**20**				

ISA=In Semester Assessment, MSE=Mid Semester Examination, ESE=End Semester Examination

*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned above. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the

nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

First Year B. Tech. Electronics and Telecommunication Engineering Preferred Semester: II
Structure and Assessment Guidelines

Course			Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Vertical	Code	Name			ISA	MSE	ESE	
BSC	BSC10T	Engineering Physics	Theory	2	15	20	40	075
	BSC10P	Engineering Physics Lab	Practical	1	25	-	25	050
	BSC04	Engineering Mathematics-II	Theory	3	20	30	50	100
ESC	ESC01T	Engineering Graphics	Theory	2	15	20	40	075
	ESC01P	Engineering Graphics Lab	Practical	1	25	-	25	050
	ESC07T	Logic Circuits	Theory	2	15	20	40	075
	ESC07P	Logic Circuits Lab	Practical	1	25	-	25	050
SC-VSEC	VSEC02T	Object Oriented Programming	Theory	2	15	20	40	075
	VSEC02P	Object Oriented Programming Lab	Practical	1	25	-	25	050
HSSM_VEC	VECXXT	Any HSSM_VEC Course	Theory	2	15	20	40	075
	VECXXP		Practical	1	25	-	25	050
HSSM_EEMC	EEMC01	Design Thinking	As per course	3	-	-	125	125
LLC-CC	CCXX*	Any one CC offered in the semester	As per course	2	25	-	50	075
			Total Credits	**23**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned above. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

Second Year B. Tech. Electronics & Telecommunication Engineering Preferred Semester: III

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40% of total marks)
NEP-Vertical	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
BSC	BSC06	Engineering Mathematics-III	Theory	3	20	30	50	100
PC_PCC	PCET102T	Microprocessor and Microcontroller	Theory	2	15	20	40	075
	PCET102P	Microprocessor and Microcontroller Lab	Practical	1	25	-	25	050
	PCET01T	Electronic Devices and Circuits	Theory	2	15	20	40	075
	PCET01P	Electronic Devices and Circuits Lab	Practical	1	25	-	25	050
	PCET02T	Principles of Communication Engineering	Theory	2	15	20	40	075
	PCET02P	Principles of Communication Engineering Lab	Practical	1	25	-	25	050
	PCET101T	Network Theory and Transmission lines	Theory	2	15	20	40	075
	PCET101P	Network Theory and Transmission lines lab	Practical	1	25	-	25	050
PC_PCC	PCET08	Instrumentation and Control Systems lab	Practical	1	25	-	25	050
VSEC	VSEC05	Skill Based Lab	Practical	1	50	-	-	050
HSSM_AEC	AEC04	Technical Communication	Practical	1	50	-	-	050
HSSM_IKS	IKSXX*	Any HSSM_IKS course	Theory	2	25	-	50	075
			Total Credits	**20**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination

*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

Second Year B. Tech. Electronics & Telecommunication Engineering Preferred Semester: IV
Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@ 40% of total marks)
NEP-Vertical	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	PCET106T	Mathematical theory of Communication	Theory	2	15	20	40	075
	PCET106P	Mathematical theory of Communication Lab	Practical	1	25	-	25	050
	PCET07T	Data Structures and Analysis of Algorithms	Theory	2	15	20	40	075
	PCET07P	Data Structures and Analysis of Algorithms Lab	Practical	1	25	-	25	050
	PCET06T	Integrated Circuits	Theory	2	15	20	40	075
	PCET06P	Integrated Circuits Lab	Practical	1	25	-	25	050
	PCET09T	Digital Communication	Theory	2	15	20	40	075
	PCET09P	Digital Communication Lab	Practical	1	25	-	25	050
	PCET100T	Signal and systems	Theory	2	15	20	40	075
	PCET100P	Signal and systems Lab	Practical	1	25	-	25	050
ELC_INT/OJ	PRJET45	Mini Project 1 (Hardware)	Practical	2	25	-	50	075
ELC-CEP	CEP01#	CEP/FP course	As per course	2	25	-	50	075
			Total Credits	**19**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

[#] **For CEP01- Social Service Internship/ Project:** 2 hours / week slot will be provided during the semester (in regular timetable). Additional work of 60 hours needs to be completed during the semester (besides regular timetable).
NOTE: As per Institute guidelines, course credits completed during the previous inter-semester break will appear in this semester's marksheet

Second Year B. Tech. Electronics and Telecommunication Engineering - Summer Break

Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40 % of total marks)
Code	Name			ISA	MSE	ESE	
OEC01[$]	Collaborative Inter-Institute Studies	As per course	4	125	-	-	125

[$] **For OEC01- Collaborative Inter Institute Studies (Credit Transfer):** Internship with other reputed institutes equivalent to 4 credits is recommended to be done by learner during second year inter semester break (i.e. summer break between semester 4 and semester 5).
NOTE: As per Institute guidelines, result of courses completed in inter semester break will appear in marksheet of next semester.

Third Year B. Tech. Electronics & Telecommunication Engineering **Preferred Semester: V**

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40 % of total marks)
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	PCET18T	Basic VLSI Design	Theory	2	15	20	40	075
	PCET18P	Basic VLSI Design Lab	Practical	1	25	-	25	050
	PCET107T	Computer Network	Theory	2	15	20	40	075
	PCET107P	Computer Network Lab	Practical	1	25	-	25	050
	PCET10T	Digital Signal Processing	Theory	2	15	20	40	075
	PCET10P	Digital Signal Processing Lab	Practical	1	25	-	25	050
	PCET103T	Electromagnetics and Antenna	Theory	2	15	20	40	075
	PCET103P	Electromagnetics and Antenna Lab	Practical	1	25	-	25	050
PC_PEC	PEETXXT	Programme Elective-1	Theory	2	15	20	40	075
	PEETXXP	Programme Elective-1 Lab	Practical	1	25	-	25	050
MDM	MDMBDXX*	As per MDM course list[##]	As per course	4	45	30	50	125
Total Credits				**19**				
Credits completed in previous inter semester break course that will appear in this semester marksheet								
OEC	OEC01[$]	Collaborative Inter-Institute Studies (Credit Transfer)	Theory	4	125	-	-	125

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

[$] **For OEC01- Collaborative Inter-Institute Studies (Credit Transfer):** Internship with other reputed institutes equivalent to 4 credits is recommended to be done by learner during second year inter semester break (i.e. summer break between semester 4 and semester 5).

Guidelines for Programme Elective Courses and Specialization Certificate – Refer Appendix-A

Important Note 1: Learners are required to go through the Appendix-A carefully before selecting the programme elective courses. Detailed guidelines regarding professional elective courses, specialization tracks and courses relevant to each track are given in Appendix-A. We have total four track. The learners can choose one track from tracks offered by department.

Programmel Elective-1 courses:

Course Code	Course Name	Specialization Track Name #
PEET20T	Modelling and Analysis of Communication System	Communication Engineering
PEET20P	Modelling and Analysis of Communication System Lab	
PEET26T	Database Management System	Data Analytics and Machine Learning
PEET26P	Database Management System Lab	
PEET32T	Modern Sensors for Internet of Thing	IoT
PEET32P	Modern Sensors for Internet of Thing Lab	
PEEC38T	Digital System Design	VLSI
PEEC38P	Digital System Design Lab	

For details of Specialization Certificate, refer Appendix – A

##For details of MDM courses refer program structure for multidisciplinary minor (MDM) program

Third Year B. Tech. Electronics & Telecommunication Engineering **Preferred Semester: VI**

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40 % of total marks)
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	PCET14T	Mobile Communication	Theory	2	15	20	40	075
	PCET14P	Mobile Communication Lab	Practical	1	25	-	25	050
	PCET104T	RF and Microwave Engineering	Theory	2	20	30	50	100
	PCET104P	RF and Microwave Engineering Lab	Practical	1	25	-	25	050
PC_PEC	PEETXXT	Programme Elective-2	Theory	2	15	20	40	075
	PEETXXP	Programme Elective-2 Lab	Practical	1	25	-	25	050
	PEETXXT	Programme Elective-3	Theory	2	15	20	40	075
	PEETXXP	Programme Elective-3 Lab	Practical	1	25	-	25	050
MDM	MDMBDXX*	As per MDM course list[##]	As per course	4	45	30	50	125
HSSM_EEMC	EEMC03	Engineering Economics	Theory	2	15	20	40	075
ELC_INT/OJT	PRJET110	Project-1 (Synopsis)	Theory	2	50	-	25	075
Total Credit				**20**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination

*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

List of Programme Elective 2 Courses:

Course Code	Course Name	Specialization Track Name #
PEET21T	Telecommunication Network Management	Communication Engineering
PEET21P	Telecommunication Network Management Lab	
PEET27T	Introduction to Data Analytics	Data Analytics and Machine Learning
PEET27P	Introduction to Data Analytics Lab	
PEET33T	Principles of Internet of Things (IoT)	IoT
PEET33P	Principles of Internet of Things (IoT)Lab	
PEEC39T	Advanced VLSI Design and Technology	VLSI
PEEC39P	Advanced VLSI Design and Technology Lab	

List of Programme Elective 3 Courses:

Course Code	Course Name	Specialization Track Name #
PEET22T	Tracking Systems	Communication Engineering
PEET22P	Tracking Systems Lab	
PEET28T	Machine Learning	Data Analytics and Machine Learning
PEET28P	Machine Learning Lab	
PEET34T	Embedded System Design with Tiny Operating System	IoT
PEET34P	Embedded System Design with Tiny Operating System Lab	
PEEC40T	Analog IC Design	VLSI
PEEC40P	Analog IC Design Lab	

#For details of Specialization Certificate, refer Appendix-A

[##]For details of MDM courses refer program structure for multidisciplinary minor (MDM) program

Third Year B. Tech. Electronics and Telecommunication Engineering - Summer Break

Course		Head of Learning	Credits	Assessment Guidelines (Marks)			Total marks (Passing@40 % of total marks)
Code	Name			ISA	MSE	ESE	
OJT01[*]	Industry Internship	Practical	5	75	-	75	150

[*]150+ hours of industry internship to be done during inter semester break between semester 6 and semester 7.

NOTE: As per Institute guidelines, result of courses completed in inter semester break will appear in marksheet of next semester.

Final Year B. Tech. Electronics & Telecommunication Engineering Preferred Semester: VII

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40 % of total marks)
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
PC_PCC	PCET105T	Optical Communication	Theory	2	15	20	40	075
	PCET105P	Optical Communication Lab	Practical	1	25	-	25	050
PC_PEC	PEETXXT	Programme Elective-4	Theory	2	15	20	40	075
	PEETXXP	Programme Elective-4 Lab	Practical	1	25	-	25	050
	PEETXXT	Programme Elective-5	Theory	2	15	20	40	075
	PEETXXP	Programme Elective-5 Lab	Practical	1	25	-	25	050
	PEETXXT	Programme Elective-6	Theory	2	15	20	40	075
	PEETXXP	Programme Elective-6 Lab	Practical	1	25	-	25	050
MDM	MDMBDXX*	As per MDM course list[##]	As per course	4	45	30	50	125
Project	PRJET111	Project 2 (Final)	Theory	4	75	-	50	125
			Total Credits	**20**				
Credits completed in previous inter semester break course that will appear in this semester marksheet								
INT_OJT	OJT01	Industry Internship	Practical	5	75	-	75	150

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

List of Programme Elective 4 Courses:

Course Code	Course Name	Specialization Track Name #
PEET23T	OFDM and MIMO Technology	Communication Engineering
PEET23P	OFDM and MIMO Technology Lab	
PEET29T	Data Mining	Data Analytics and Machine Learning
PEET29P	Data Mining Lab	
PEET35T	Internet of Things (IoT) and Edge Computing	IoT
PEET35P	Internet of Things (IoT) and Edge Computing Lab	
PEEC41T	ASIC and Verification	VLSI
PEEC41P	ASIC and Verification Lab	

List of Programme Elective 5 Courses:

Course Code	Course Name	Specialization Track Name #
PEET24T	Satellite Communication	Communication Engineering
PEET24P	Satellite Communication Lab	
PEET30T	Big data Analytics	Data Analytics and Machine Learning
PEET30P	Big data Analytics Lab	
PEET36T	Internet of Things (IoT) Security and Trust	IoT
PEET36P	Internet of Things (IoT) Security and Trust Lab	
PEEC42T	System on Chip	VLSI
PEEC42P	System on Chip Lab	

List of Programme Elective 6 Courses:

Course Code	Course Name	Specialization Track Name #
PEET25T	Wireless sensor networks	Communication Engineering
PEET25P	Wireless sensor networks Lab	
PEET31T	Deep Learning	Data Analytics and Machine Learning
PEET31P	Deep Learning Lab	
PEET37T	Industrial Internet of Things (IIoT)	IoT
PEET37P	Industrial Internet of Things (IIoT) Lab	
PEEC43T	Mixed signal VLSI	VLSI
PEEC43P	Mixed signal VLSI Lab	

#For details of Specialization Certificate, refer Appendix-A

##For details of MDM courses refer program structure for multidisciplinary minor (MDM) program

Final Year B. Tech. Electronics & Telecommunication Engineering **Preferred Semester: VIII**

Course Structure and Assessment Guidelines

	Course		Head of Learning	Credits	Assessment guidelines (Marks)			Total marks (Passing@40 % of total marks)
NEP-Verticals	**Code**	**Name**			**ISA**	**MSE**	**ESE**	
MDC_OE	OECXX*	Any two from the offered Open Elective courses	Theory	2	15	20	40	075
MDC_OE	OECXX*		Theory	2	15	20	40	075
ELC_INT/OJT	OJT02	Industry Internship	Practical	7	100	-	100	200
ELC_RM	RM01	Research Methodology	Theory	3	20	30	50	100
MDM	MDM01*	Seminar as per MDM course list	As per course	2	25	-	50	075
Total Credit				**16**				

ISA=In Semester Assessment, MSE= Mid Semester Examination, ESA= End Semester Examination
*Selection based on the subset of courses made available by the Institute for the semester.

The assessment guidelines for the courses of different credits are mentioned in the above table. Notwithstanding the above, each course faculty shall have the choice to propose her/his assessment methodology based on the nature of the course. However, the proposed assessment methodology shall be approved by a panel constituted at Institute level and published to the learners before the commencement of the semester.

Appendix-A

Guidelines for Programme Elective Courses and Specialization Certificate

Programme Elective courses are designed to meet industrial requirements. All learners must opt for 6 professional elective courses (both theory and practical components) as a part of requirement for B.Tech. degree.

Specialization Certificate is introduced to build competency of learners in the chosen domain. Department of Electronics & Telecommunication Engineering, along with other departments of the Institute, offers the following specialization tracks for the students of EXTC department:

Sr. No.	Specialization Track Name	Offered By the Department of
1	Communication Engineering	Electronics & Telecommunication Engineering
2	Data Analytics and Machine Learning	Electronics & Telecommunication Engineering
3	Internet of Things (IoT)	Electronics & Telecommunication Engineering
4	Very Large Scale Integrated (VLSI)	Electronics & Computer Engineering

We are offering total six programme electives from semester 5 to 7. The learner must choose one course in semester 5, two courses in semester 6 and three courses in semester 7, from selected specialization track to fulfil the required credits for the award of degree.
Student must follow the same track once opted.
If learners complete all Programme Elective courses from the same chosen track, they will be eligible to receive a Specialization Certificate from the Institute.

It should be noted that there are no additional credit requirements for these specialisations.

Communication Engineering track: Courses to be chosen for specialization in Communication Engineering track

Semester	Course Code	Course Name
V	PEET20T	Modelling and Analysis of Communication System
V	PEET20P	Modelling and Analysis of Communication System Lab
VI	PEET21T	Telecommunication Network Management
VI	PEET21P	Telecommunication Network Management Lab
VI	PEET22T	Tracking System
VI	PEET22P	Tracking System Lab
VII	PEET23T	OFDM and MIMO Technology
VII	PEET23P	OFDM and MIMO Technology Lab
VII	PEET24T	Satellite Communication
VII	PEET24P	Satellite Communication Lab
VII	PEET25T	Wireless sensor networks
VII	PEET25P	Wireless sensor networks Lab

Data Analytics and Machine Learning track: Courses to be chosen for specialization in Data Analytics and Machine Learning

Semester	Course Code	Course Name
V	PEET26T	Database Management System
V	PEET26P	Database Management System Lab
VI	PEET27T	Introduction to Data Analytics
VI	PEET27P	Introduction to Data Analytics Lab
VI	PEET28T	Machine Learning
VI	PEET28P	Machine Learning Lab
VII	PEET29T	Data Mining
VII	PEET29P	Data Mining Lab
VII	PEET30T	Big data Analytics
VII	PEET30P	Big data Analytics Lab
VII	PEET31T	Deep Learning
VII	PEET31P	Deep Learning Lab

IoT track: Courses to be chosen for specialization in Internet of Thing (IoT)

Semester	Course Code	Course Name
V	PEET32T	Modern Sensors for IOT
V	PEET32P	Modern Sensors for IOT Lab
VI	PEET33T	Principles of IOT
VI	PEET33P	Principles of IOT Lab
VI	PEET34T	Embedded System Design with tiny OS
VI	PEET34P	Embedded System Design with tiny OS Lab
VII	PEET35T	IoT and Edge Computing
VII	PEET35P	IoT and Edge Computing Lab
VII	PEET36T	IoT Security and Trust
VII	PEET36P	IoT Security and Trust Lab
VII	PEET37T	Industrial IOT
VII	PEET37P	Industrial IOT Lab

VLSI track: Courses to be chosen for specialization in Very Large-Scale Integration

Semester	Course Code	Course Name
V	PEEC38T	Digital System Design
V	PEEC38P	Digital System Design Lab
VI	PEEC39T	Advanced VLSI Design and Technology
VI	PEEC39P	Advanced VLSI Design and Technology Lab
VI	PEEC40T	Analog IC Design

VI	PEEC40P	Analog IC Design Lab
VII	PEEC41T	ASIC and Verification
VII	PEEC41P	ASIC and Verification Lab
VII	PEEC42T	System on Chip
VII	PEEC42P	System on Chip Lab
VII	PEEC43T	Mixed Signal VLSI
VII	PEEC43P	Mixed Signal VLSI Lab